

# PATENT SPECIFICATION

DRAWINGS ATTACHED

Inventor: SAMUEL CLIFFORD WALTER WILKINSON

867.610



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International Classification:—F06k.

## COMPLETE SPECIFICATION

### Improvements relating to Fluid Valves of Plug Cock Type

We, CRANE PACKING LIMITED, a British Company of Berwick Avenue, Slough, Buckinghamshire, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to fluid valves or so-called plug cocks, in which an apertured plug is rotatable in the bore of a casing and has particular reference to a plug cock in which the plug-receiving bore is lined with a material having a low coefficient of friction, such as nylon, polytetra-fluoroethylene and other synthetic plastic materials having similar qualities.

The main object of this invention is to provide an improved construction of plug cock of the kind having a lining composed of a material having a low coefficient of friction, said improved construction facilitating the positioning of the lining, whilst eliminating the need for accurate machining, particularly the lapping of seats for the lining in the bore of the plug cock and for the plug in the lining.

Another object of this invention is to provide such an improved plug cock which is so constructed as to permit, while the plug cock is in use, of adjustment of the liner to increase the effectiveness of the fluid sealing property of the liner and also, if desired, to tighten the liner around the plug so that it is locked or bound against movement—with the plug in the fully open position, the fully closed position or any intermediate position.

A further object is to provide for replacement of the liner as and when required, there being normally no wear of metal components of the cock.

With the foregoing objects in view the [Price 3s. 6d.]

present invention provides a plug cock comprising a slit or split casing having fluid porting opening into its bore, a lining for said bore apertured to register with said porting, an apertured plug rotatable in said lining and fastener means for clamping the slit or split casing on to the lining. A slit casing means one having a single longitudinal saw-cut or similar narrow opening, whereas a split casing may comprise more than two sections.

Embodiments of the invention are illustrated, by way of example, in the accompanying drawings, wherein:

Figures 1 and 2 are respectively an elevation of and a longitudinal sectional view through a plug cock having a split bipartite casing,

Figure 3 is a so-called exploded perspective view showing the component parts of the cock separated,

Figure 4 is a plan view of a plug cock having a unitary casing slit longitudinally,

Figure 5 is a cross section on line V—V of Figure 4, and

Figure 6 is a plan view of a modified split casing plug cock, namely, one with a tripartite casing.

In the construction illustrated in Figures 1 to 3 the casing is of bipartite form, being split longitudinally at right angles to the axially aligned flanged passageways 2, 3 to form two similar halves 1, 1A. Either of the passageways 2 and 3 can be used as an inlet and the other as an outlet. The through bore 4 of the split casing 1—1A is recessed to form an annular chamber 5 into which the passageways 2, 3 open. Opposite ends of the chamber 5 have the walls knurled or otherwise roughened at 5A to key in position and hold against rotation a liner 6 in the form of a sleeve made of a suitable

synthetic plastic having a low coefficient of friction.

The liner 6, which has apertures 6A which are aligned on assembly, with passageways 2, 3 receives as a sliding fit, a straight cylindrical plug 7. The plug 7 has a cross bore 8 which by rotation of said plug may be moved between a position in which full-bore communication is established between the aligned passageways 2, 3 and a position in which said passageways are obturated.

The halves 1, 1A of the split casing are clampable on to the liner 6 and the enclosed plug 7 by screw fasteners 9, the tightness of fastening being adjustable as and when required to provide any desired degree of resistance to turning of plug 7.

If the plug cock is to work under fluctuating temperature conditions, springs may be interposed between the casing halves and the heads of the fasteners so that expansion and contraction of the liner and other components is compensated for automatically. Turning of the plug 7 is effected through a shank 10 which projects out through one end of bore 4.

As the split casing 1—1A is adapted to be clamped in position a high degree of accuracy in the machining of the casing and the plug is necessary.

Figures 4 and 5 shows that the casing 1B need not be split to form separate sections but may have a single longitudinal slit 14 flanked by lateral lugs 12, the screw fastener 9 serving to close the slit body onto the liner 6. An additional flanged connection 15, indicated in chain-dot lines, may be provided, if desired, on the split casing 1B. At one end of the valve casing 1B an internal flange 16 is provided to form a seating for one end of the liner 6, which is held against endwise movement by a spring clip 17 abutting the other end of the liner 6 and engaging a groove 18 within the bore 4. The outside diameter of the liner 6 constitute an interference fit with the bore 4 when the slit casing 1B has been contracted circumferentially by fasteners 9, so that the fasteners 9 must be slackened to allow the casing 1B to spring open slightly before the liner 6 can be inserted.

Figure 6 illustrates a modification in which a split plug cock casing is comprised of three sections 1a, 1b 1c, with laterally projecting lugs 12 by means of which adjacent sections secured together by screw fasteners 9; more than three body sections could be used. Each casing section has one (or more) flanged connectors 19 adapted for connection with pipe unions of different sizes, if desired, so that from a series of casing sections a wide range of plug cocks may be assembled; the plug 7 is limited as to endwise movement

by a springy clip 17 in the manner described with reference to Figures 4 and 5.

#### WHAT WE CLAIM IS:—

1. A plug valve comprising a longitudinally slit or split valve casing having ports opening into its bore, a liner composed of material having a low coefficient of friction for said bore and apertured to register with said body porting, an apertured plug rotatable in said liner and fastener means for clamping the longitudinally slit or split casing onto the liner and the plug therein.

2. A plug valve comprising a valve body having a substantially cylindrical bore with ports in the valve body opening into said bore, said valve body being slit or split longitudinally to permit of circumferential or radial contraction, an undivided cylindrical liner composed of a material having a low coefficient of friction and having therein openings for aligning with said body ports, said liner having an external diameter constituting an interference fit with the valve body bore when contracted, a plug rotatable within said liner and having passages therein alignable with the aligned liner openings and body ports and clamping means for contracting said divided body onto said liner and the plug therein.

3. A plug valve as claimed in claim 1 or claim 2, wherein the liner is composed of a slightly compressible material having a low coefficient of friction and capable of binding onto the plug which is normally rotatable therein in order to hold the plug against rotation.

4. A plug valve as claimed in any one of the preceding claims, in which the bore of the casing is enlarged to form an annular recess within which the liner is held against endwise movement.

5. A plug valve as claimed in claim 4, further characterised in that the annular recess portion of the valve casing is large enough to accommodate the liner and to extend over the end of the plug to hold the latter against endwise movement.

6. A plug valve as claimed in any of the preceding claims 1 to 5, characterised in that the valve casing has an internal flange constituted a seating for one end of the liner, which is restrained against endwise movement by a spring clip abutting the other end of the liner and engaging a groove in the valve casing bore.

7. Plug valves constructed substantially as herein described with reference to the accompanying drawings.

STEVENS, LANGNER, PARRY  
& ROLLINSON,

Chartered Patent Agents,  
Agents for the Applicants.

## PROVISIONAL SPECIFICATION

## Improvements relating to Fluid Valves of Plug Cock Type

We, CRANE PACKING LIMITED, a British Company of Berwick Avenue, Slough, Buckinghamshire do hereby declare this invention to be described in the following statement:—

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10 with a low friction material, such as nylon, polytetrafluorethylene and other synthetic plastic materials having similar qualities.

The main object of this invention is to provide an improved construction of plug cock of the kind having a low friction lining, said improved construction facilitating the positioning of the lining, whilst eliminating the need for accurate machining, particularly the lapping of seats for the lining in the bore of the plug  
15 cock and for the plug in the lining.

Another object of this invention is to provide such an improved plug cock which is so constructed as to permit, while the plug cock is in use, of adjustment of the liner to increase the effectiveness of the fluid sealing property of the liner and also, if desired, to tighten the liner around the plug so that it is locked or bound against movement—with the plug in the fully open position, the fully closed position or any intermediate  
20 position.

A further object is to provide for replacement of the liner as and when required, there being normally no wear of metal components of the cock.

With the foregoing objects in view the present invention provides a plug cock comprising a slit or split casing or body having fluid porting opening into its bore, a lining for said bore apertured to register with said  
25 porting, an apertured plug rotatable in said lining and fastener means for clamping the slit of split casing or body on to the lining. A split casing may comprise more than two sections.

Embodiments of the invention are illustrated, by way of example, in the accompanying drawings, wherein:

Figures 1 and 2 are part-sectional elevation and plan views of a plug cock having a split  
30 bipartite casing.

Figure 3 is a plan view of a plug cock having a unitary casing slit longitudinally.

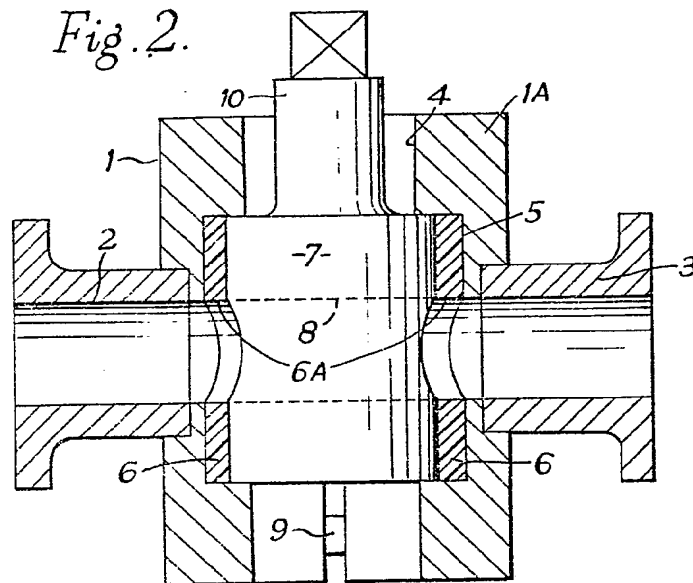
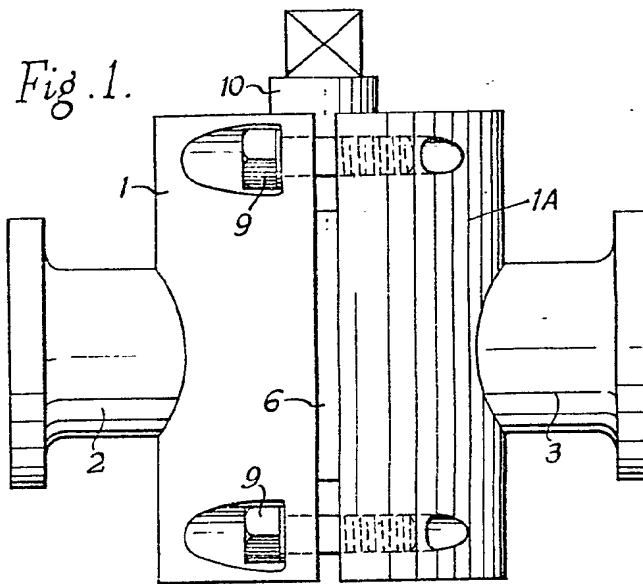
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35 form, being split longitudinally at right angles to the axially aligned flanged passageways 2, 3 to form two similar halves 1, 1A. Either of the passageways 2 and 3 can be used as an inlet and the other as an outlet.  
40 The through bore 4 of the split body 1—1A is recessed to form an annular chamber 5 into which the passageways 2, 3 open. Opposite ends of the chamber 5 have the walls knurled or otherwise roughened to key in  
45 position and hold against rotation a liner 6 in the form of a sleeve made of a suitable low friction synthetic plastic. Within the liner 6 is received, on assembly, as a sliding fit, a straight cylindrical plug 7 having a  
50 cross bore 8 which on rotation may be moved between a position in which full-bore communication is established between the aligned passageways 2, 3 and a position in which said passageways are obturated.

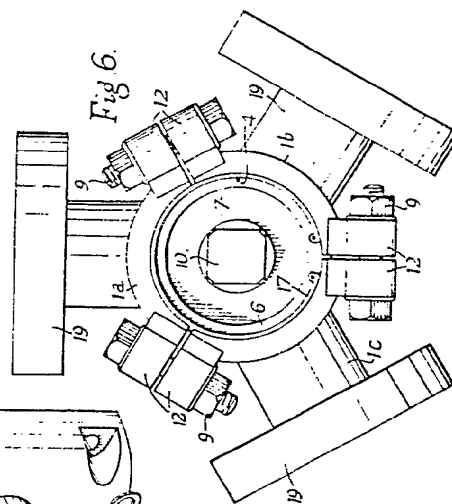
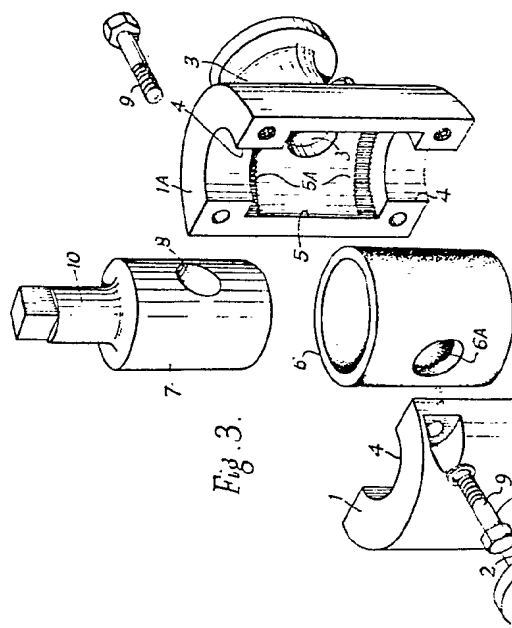
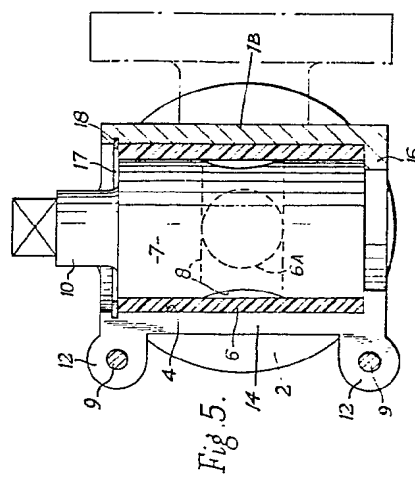
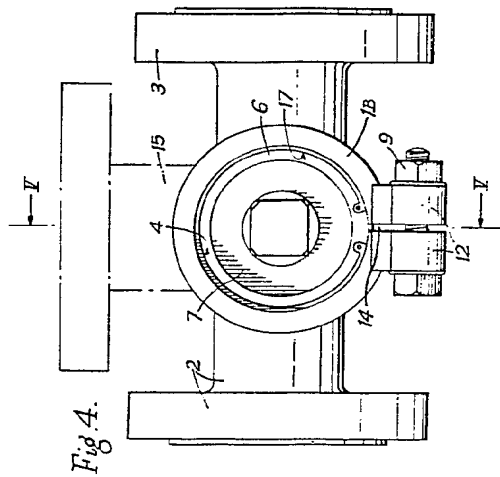
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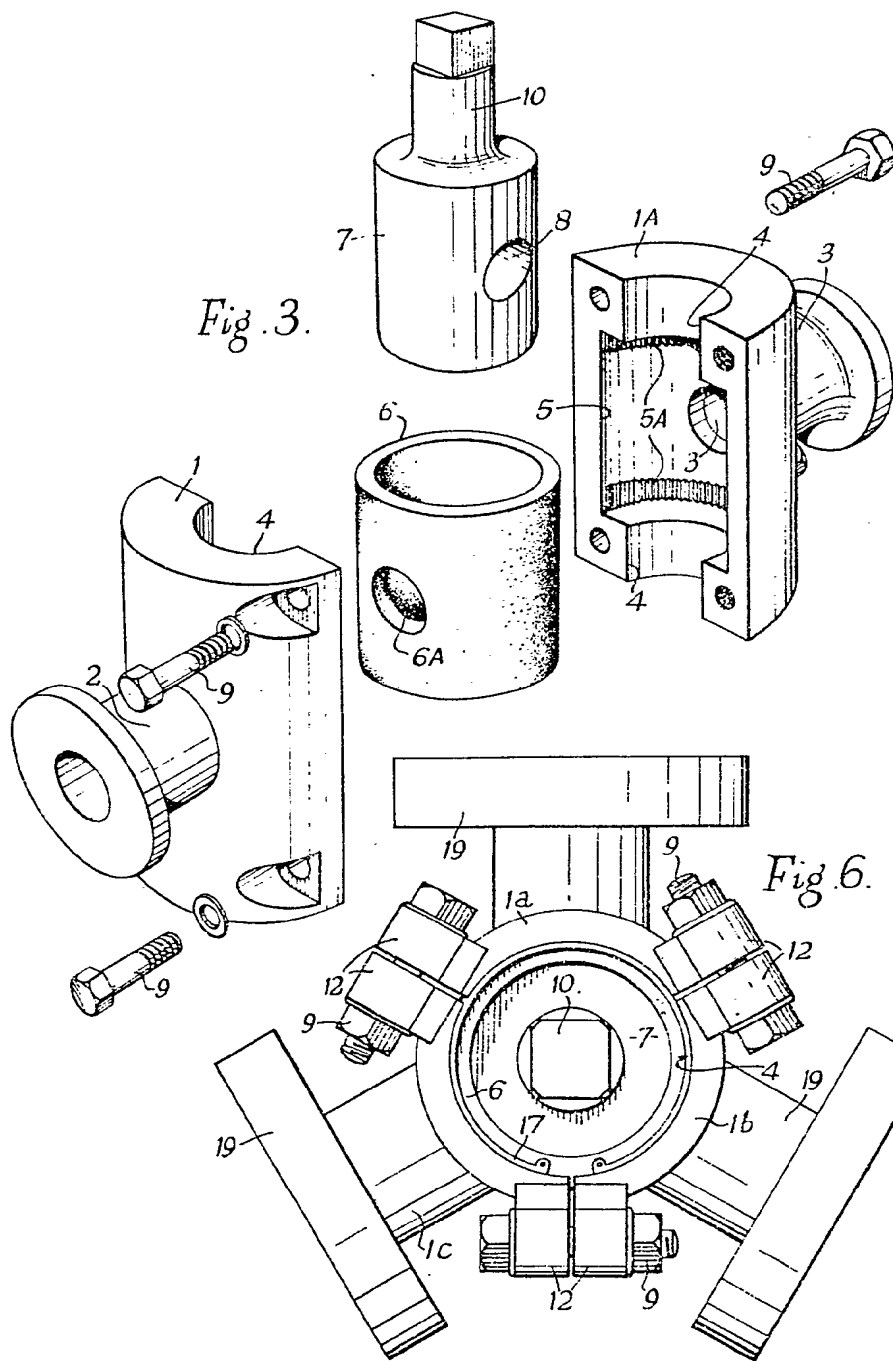
As the split body 1—1A is adapted to be clamped in position a high degree of accuracy in the machining of the body and the plug is necessary.

Figure 3 shows that the body 1B need not be split to form separate sections by may have a single longitudinal slit 14 flanked by lateral lugs 12, the screw fastener(s) 9 serving to close the slit body onto the liner 6. An additional flanged connection 15, indicated in chain-dot lines, may be provided, if desired, on the split body 1B.

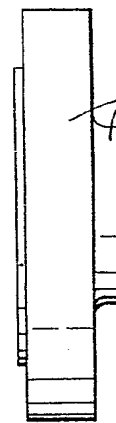
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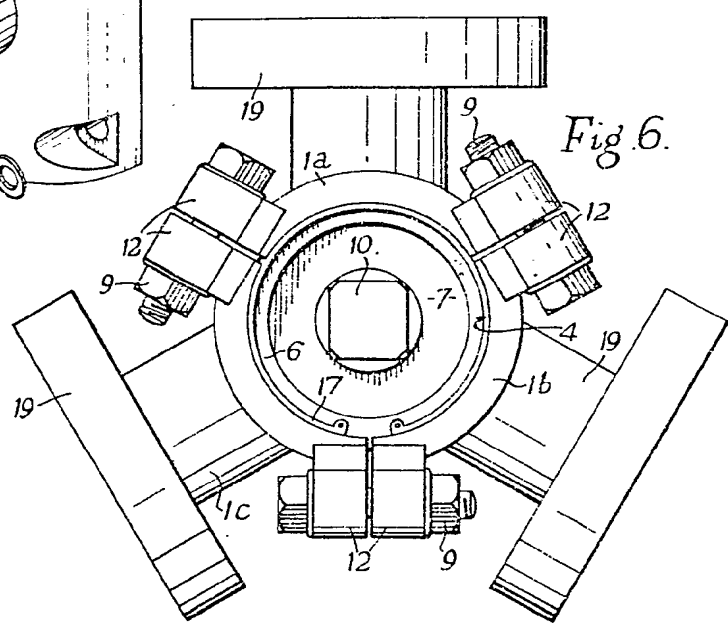




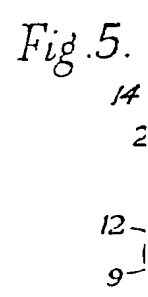
*Fig. 4.*



*Fig. 6.*



*Fig. 5.*



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COMPLETE SPECIFICATION

3 SHEETS

This drawing is a reproduction of  
the Original on a reduced scale.

SHEETS 2 & 3

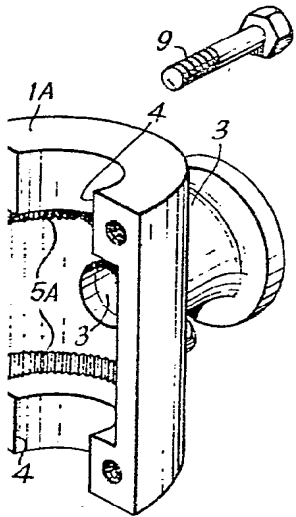


Fig. 4.

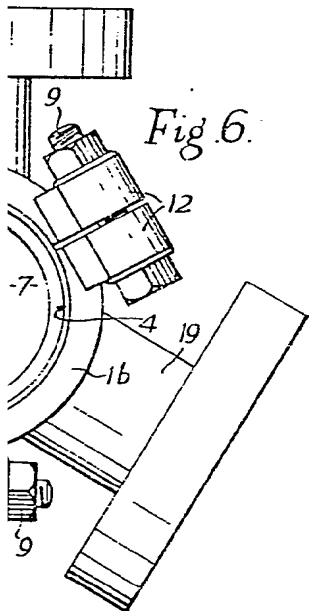
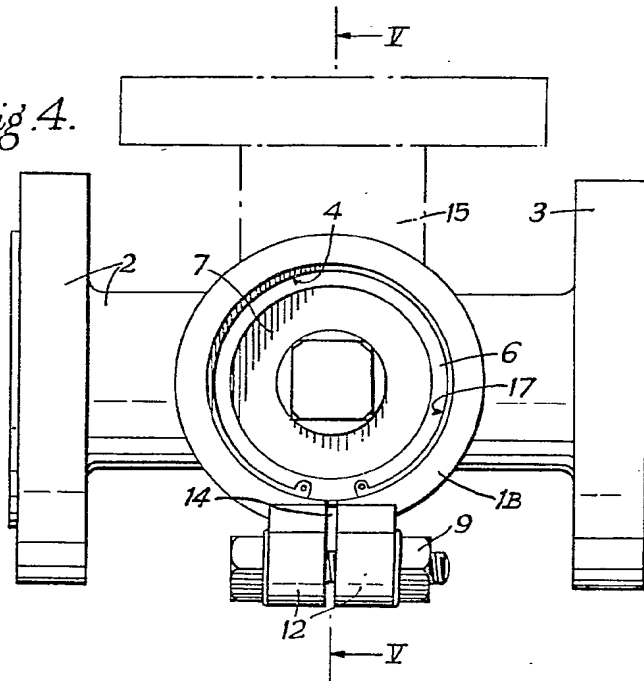
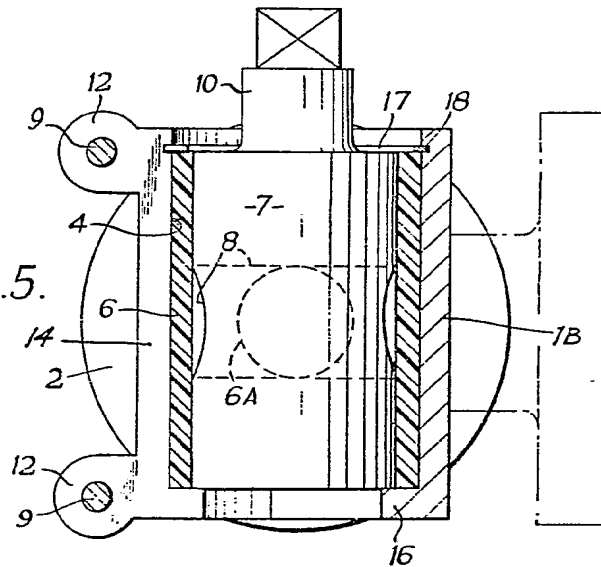
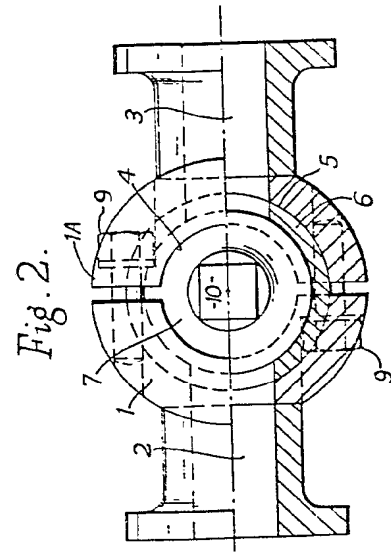
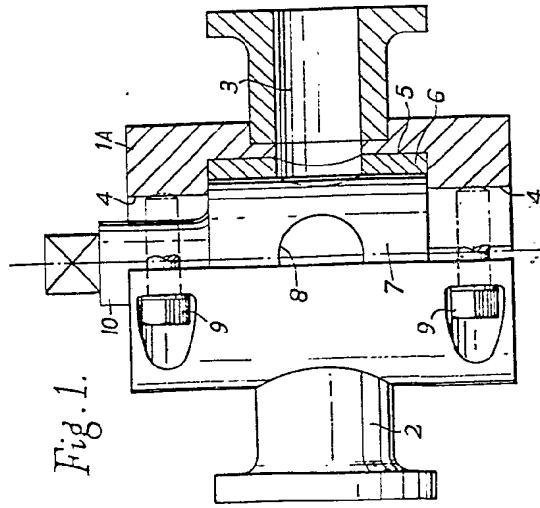


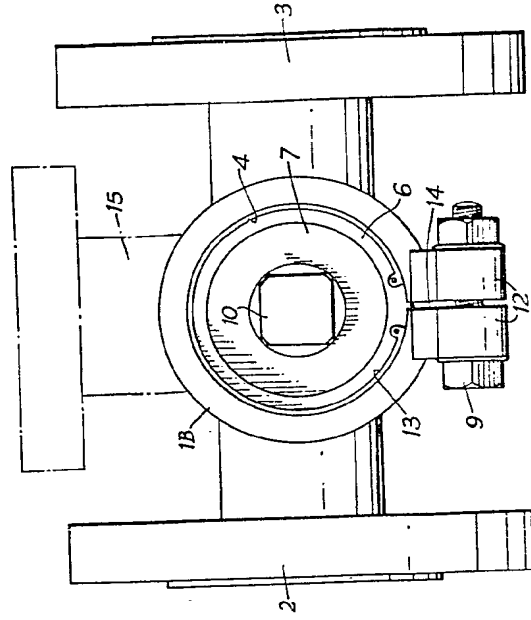
Fig. 6.

Fig. 5.





*Fig. 3.*





*Fig. 1.*

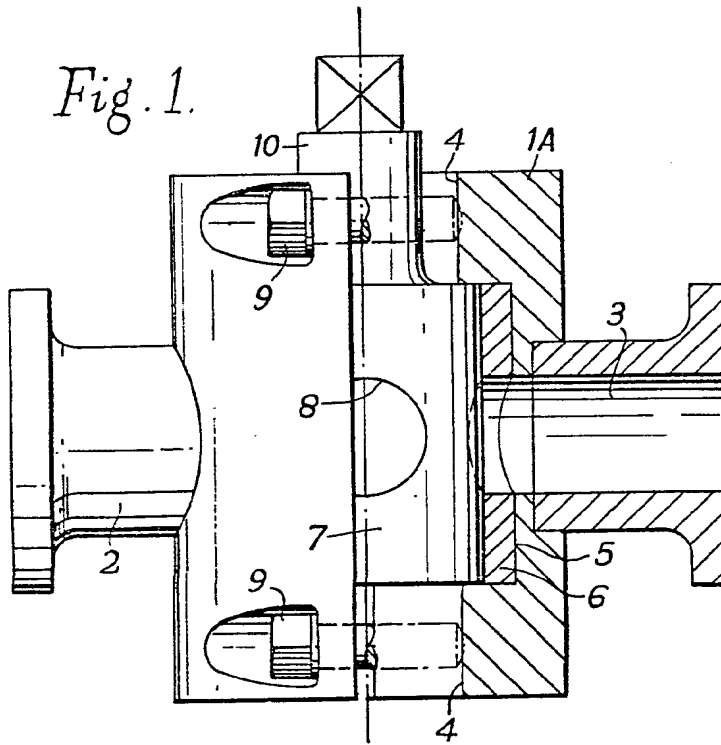
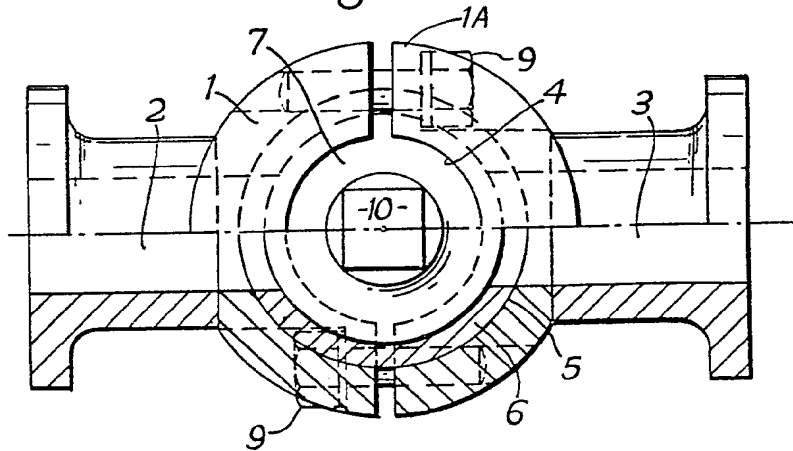


Fig. 2.



*Fig. 3.*

